



Visual Learning for Earth Sciences Education

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Visual learning has proven to be helpful in understanding otherwise elusive scientific principles. The case of Earth Science is not an exception, as pioneering works have demonstrated. Interaction and immersion are also important, for active involvement triggers more neurological areas, which improves the retention and understanding of scientific concepts. Modern technology can be used to improve teaching by allowing interactivity with models and involving more senses in the learning process at an affordable cost. To make visualization and interactive multimedia really effective for education purposes, it has to be appropriately designed to actually stimulate the formation of corresponding mental models in students minds and provide a cognitively engaged experience. That requires not only the use of technology but the combined effort of a multidisciplinary team. This being an area still under development, we will present some results based on our own experience.

We will talk about recent developments in the area of visual learning in Earth Sciences and in particular we will talk about our experience in our Visualization Laboratory for Earth Sciences as a visual learning environment for graduate students. We will talk about the components necessary to make such a learning environment effective to produce, store and catalog learning objects, and make them usable at different levels, from a personal computer to a fully equipped virtual reality room. Then we will present the actual pipeline used to produce a learning object. We will include examples of these applications. This kind of endeavor is necessarily multidisciplinary. To produce high quality interactive multimedia learning objects it is necessary to combine the skill of programmers that understand science and mathematics, the visual communication skills of graphic designers, and the guidance of Earth Science specialists.